



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Chengua "Oliver" Han § Group Art Unit: 3641  
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Serial No.: 10/027,727 §  
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For: SHAPED CHARGE § Atty. Dkt. No.: 22.1450  
§ SHL.0227US

Mail Stop Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

REPLY BRIEF

Dear Sir:

The following is submitted to the Examiner's Answer. Applicant notes that the Examiner has withdrawn the § 102 rejections in view of the German reference and the § 102 rejections of claims 3, 6, 19 and 34.

Regarding the § 102 rejections of independent claims 1, 17 and 33 in view of Renfro, the Examiner's position centers around the construction of "charge case," a construction in which the Examiner relies on the dictionary definition of "casing."<sup>1</sup> However, the Examiner's construction of "charge case" is unreasonable for at least the reasons that 1.) the claims recite a "charge case," a phrase that has a significant meaning in the art, which may not be derived by independently considering the non-technical dictionary definition of "case" or "casing"

<sup>1</sup> The Examiner relies on the dictionary definition of "casing" for the first time in the Examiner's Answer.

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apart from "charge case"; and 2.) the Examiner's actual construction of "charge case" is based on the dictionary definition of "casing," which is irrelevant to the construction of a charge *case* (*emphasis added*).

In the discussion of the basic components of a shaped charge, Renfro uses the term "case" inconsistently with the Examiner's construction of "charge case." More specifically, in lines 21-27 of column 1, Renfro states that a shaped charge "includes the usual case, concave shaped explosive material packed against the inner wall of the case, and a metal liner lining the concave side of the shaped explosive." Thus, contrary to the Examiner's construction of "charge case," Renfro's Background section describes the liner and case as being separate and distinct elements of a shaped charge. This is consistent with the remaining disclosure of Renfro, as Renfro's disclosure is directed to a liner 50, not the housing 14 (arguably a charge case), of a shaped charge. Renfro fails to teach that the liner 50 is part of or functions as part of a charge case. Furthermore, Renfro does not disclose that the liner 50 is integral with or attached to the housing 14 or serves the same function as the housing 14.

Additionally, based on the non-technical dictionary pages cited by the Examiner, Renfro's liner 50 does not fall within the scope of a "case." For example, based on the excerpt from *Webster's New World Dictionary*, a "case" is either "a container, as a box, crate, chest, sheath, folder, etc." or "a protective covering or covering part." It is noted that the liner 50 does not serve as a container, as a box ,crate, chest, sheath, folder, etc; but rather, the outer convex surface of the liner 50 is inserted into the explosive material to form the shape of the explosive material. The liner 50 is also not a protective covering or a protective covering part for the shaped charge. Such protection is provided either from a perforating gun or tubing, or from a cover that is assembled to the housing 14, as recited in lines 27-37 of column 10 of Renfro, which is reproduced below:

The embodiments addressed above involve an open shaped-charge, i.e. one without a cover. This type of shaped-charge is typically used within a perforating gun or tubing, which provides protection from direct exposure to the downhole pressure and environment.

Alternative shaped-charges have covers that cooperate with the housing to protect each individual charge from direct exposure to the downhole environment. While not specifically addressed here, the benefits of the present invention would equally apply to such covered charges, as would be recognized by one of skill in the art.

Thus, Renfro makes it clear that the liner 50 does not "complete" the housing 14 or otherwise serve as part of a charge case. Therefore, even assuming, for purposes of argument, that the meaning of the phrase "charge case" may be determined by parsing this phrase and analyzing the non-technical meaning of "case," the meaning derived from this construction technique does not have a sufficient scope to cover Renfro's liner 50.

Therefore, when a reasonable construction is assigned to "charge case," it becomes clear that Renfro fails to teach or even suggest a charge case that defines at least one slot about which the charge case is adapted to fracture; and for at least this reason, Renfro fails to anticipate either independent claim 1, 17 or 33.

Regarding the § 102 rejection of independent claim 17 in view of Chawla, Chawla fails to teach or suggest the act of providing of independent claim 17. More specifically, the Examiner states that the score marks 46 allegedly teach the slot(s) of independent claim 17. As stated by the Examiner, the score marks 46 are present during the manufacture of the liner 36. Examiner's Answer, 5. The Examiner also contends that Chawla's liner 36 may function as a charge case and based on this observation, the Examiner concludes that the score marks 46 are present in a charge case. *Id.*

Even assuming, for purposes of argument, that the score marks 46 are present in a sheet that is used to make charge cases, Chawla stills fails to anticipate independent claim 17. More specifically, claim 17 explicitly recites providing a *perforating string* that has one or more *shaped charges*, and these *shaped charges* include a charge case that defines at least one slot about which the charge case is adapted to fracture. (*emphasis added*). Thus, even assuming that the score marks 46 are present in a material during the manufacture of a shaped charge case, there is no teaching or suggestion in Chawla that the score marks 46 somehow end up in the charge casings or the shaped charges that incorporate these charge casings; and for similar reasons, there is no teaching or suggestion in Chawla that the score marks 46 somehow end up in a perforating string that has shaped charges. Furthermore, even if portions of the score marks 46 remain, there is no teaching or even a suggestion in Chawla that a charge case of a shaped charge of a perforating string would fracture about a remnant of the score mark 46. Thus, for at least these reasons, Chawla fails to anticipate independent claim 17, as Chawla fails to teach or suggest a slot about which a charge case that is part of a perforating string fractures. A material that is used in the manufacture of a charge case prior to its assembly into a shaped charge or its inclusion in a perforating sting as part of this shaped charge is irrelevant to establishing a *prima facie* case of anticipation for claim 17.

Therefore, for at least the reasons that are set forth above, the § 102 rejections of claims 1, 7, 17, 18, 22, 23, 25, 27, 28, 30, 33 and 35 are in error and should be reversed.

Respectfully submitted,



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## APPENDIX OF CLAIMS

The claims on appeal are:

1. A controlled debris perforating system, comprising:

a shaped charge having a charge case and an explosive material, the charge case defining at least one slot about which the charge case is adapted to fracture in response to detonation of the explosive material.

3. The controlled debris perforating system of claim 1, wherein the at least one slot is axially oriented.

6. The controlled debris perforating system of claim 1, wherein the at least one slot is a V-notched groove.

7. The controlled debris perforating system of claim 1, wherein the at least one slot is an external slot.

17. A method of using one or more shaped charges in a well, comprising:

providing a perforating string having one or more shaped charges, the shaped charges comprising a charge case defining at least one slot about which the charge case is adapted to fracture; and

conveying the perforating string into the well.

18. The method of claim 17, wherein the perforating string comprises a loading tube and carrier.
19. The method of claim 17, wherein the perforating string comprises a spiral gun.
22. The controlled debris perforating system of claim 1, wherein the case comprises an opening to receive the explosive material and the opening is separate from said at least one slot.
23. The controlled debris perforating system of claim 1, wherein said at least slot comprises at least one groove formed in a wall of the case.
25. The controlled debris perforating system of claim 23, wherein said at least one groove is cut into the wall of the case.
27. The method of claim 17, wherein the case comprises an opening to receive an explosive material and the opening is separate from said at least one slot.
28. The method of claim 17, wherein said at least slot comprises at least one groove formed in a wall of the case.
30. The method of claim 28, wherein said at least one groove is cut into the wall of the case.

33. A method of controlling the debris during perforating, comprising:  
providing a shaped charge having a charge case defining at least one groove about  
which the charge case is adapted to fracture in response to detonation of an explosive.

34. The method of claim 33, wherein said at least one groove is axially oriented.

35. The method of claim 33, wherein said at least one groove is located on the outside  
of the charge case.